# 1 Introduction: Access from Above, Access from Below

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In 2009, a Russian neuroscience student named Aleksandra Elbakyan started a master's thesis on biometric scanning at Kazakhstan University. Like many students and academics outside U.S. and European universities, Elbakyan had little access to research on her topic: her university didn't subscribe to the international databases that contain most of the world's scientific articles. Like many scholars in similar positions, she relied on material shared by colleagues based at or visiting universities that do provide access. Finding articles under such circumstances was haphazard and slow. For the most part, Elbakyan obtained them through personal contacts or professional networks that tried to match individual requests for articles with copies.

Unauthorized digital copies of books and articles began to be aggregated into online collections in the early 2000s. In most cases, these collections were small—personal collections of scanned materials shared via listservs and social media accounts. In a few cases, these collections grew into larger, curated archives—the Russian-language Library Genesis site (usually called LibGen), the Spanish-language Hansi library, and the social theory archive Aaaaarg (yes, the pirate sound) were early examples. Together, these methods of collecting and sharing enabled a slow osmosis of scholarly literature from more privileged to less privileged students, researchers, and universities. Elbakyan found a way to accelerate the process.

In 2011, Elbakyan launched Sci-Hub, a search and download service for journal articles. Sci-Hub was connected to LibGen, which by then had grown into a mostly academic, mostly unauthorized archive of over half a million books and articles. By most accounts, Elbakyan's innovation was to mobilize university colleagues to share not individual articles, but "virtual private network" credentials for campus intranets in Western universities, which enabled access to the major journal databases.

The core method was simple but ingenious. On Sci-Hub, a search for an article triggered a search of LibGen. If the article wasn't found in LibGen, Sci-Hub searched the major journal databases using the acquired credentials. When the user downloaded

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a copy, Sci-Hub simultaneously uploaded a copy to LibGen, ensuring that the next request for the document could be met from within the collection. By 2016, Sci-Hub/LibGen had grown to around fifty million articles. Over a six-month period in 2015–2016, it had over 28 million downloads (Bohannon 2016).

Because Sci-Hub circumvented the paywalls on which much of the scientific publishing world was built, the major publishers were eager to shut it down. In late 2015, Elsevier, whose ScienceDirect database was a major source for Sci-Hub, obtained an injunction in a U.S. court targeting the service, LibGen, several other unauthorized book archives, and Elbakyan personally—one of the only publicly identified individuals in this world of shadow libraries. In early 2017, the outcome was still uncertain: Sci-Hub had been forced to switch domains twice and had disabled its direct search capabilities. The LibGen site had been up and down several times in the preceding year. Although the Russian services that hosted Sci-Hub and LibGen remain relatively insulated from U.S. injunctions, the sites depend on other parts of the Internet that are more vulnerable to legal pressure—domain name registrars, search engines, and Internet service providers especially. When these companies comply with injunctions, they can make life difficult, though rarely impossible, for the targeted services.

As everyone from Elbakyan to Elsevier knew, however, Sci-Hub's importance was not its permanence as a service but its status as a proof of concept. Its core archive of fifty million articles was freely available and its basic search and archive features easily replicated. Elbakyan herself estimated that the full archive has been copied many times, moving well beyond the network of Russian academics and hackers who formed the core community behind LibGen and many of the other top-level archives. Although Elbakyan made no significant effort to hide her identity and may face arrest on charges of copyright infringement, the larger network of pirate archivists behind the other services has kept a much lower profile.

The Sci-Hub story made headlines as the authors and researchers involved in this book were wrapping up our study of this rapidly changing knowledge ecosystem. *Shadow Libraries* explores this reorganization of the flow of educational and research materials as they pass from authors to publishers and libraries, to students and researchers, and from comparatively rich universities to poorer ones.

From the top down, *Shadow Libraries* explores the institutions that shape the provision of these materials, from the formal sector of universities and publishers to the broadly informal ones organized by faculty, copy shops, student unions, and students themselves. It looks at the history of policy battles over access to education in the post–World War II era and at the narrower versions that have played out in relation to

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research and textbooks, from library policies to book subsidies to, more recently, the several "open" publication models that have emerged in the higher education sector.[1]

From the bottom up, *Shadow Libraries* explores how, simply, students get the materials they need. It maps the ubiquitous practice of photocopying and what are—in many cases—the more marginal ones of buying books, visiting libraries, and downloading from unauthorized sources. It looks at the informal networks that emerge in many contexts to share materials, from face-to-face student networks to Facebook groups, and at the processes that lead to the consolidation of some of those efforts into more organized archives that circulate offline and sometimes online—the shadow libraries of our title. If Elbakyan's Sci-Hub is the largest of these efforts to date, the more characteristic part of her story is the prologue: the personal struggle to participate in global scientific and educational communities, and the recourse to a wide array of ad hoc strategies and networks when formal, authorized means are lacking. If Elbakyan's story has struck a chord, it is in part because it brings this contradiction in the academic project into sharp relief—universalist in principle and unequal in practice. *Shadow Libraries* is a study of that tension in the digital era.

## Piracy

*Shadow Libraries* grew out of a book called *Media Piracy in Emerging Economies* (Karaganis 2011), which brought a similar perspective to bear on the question of access to media outside the high-income West. To a large extent, our work on *Shadow Libraries* started where *Media Piracy* ended, with the confirmation that the main factors underlying high rates of piracy in the developing world were the obvious ones: high prices for legal media, low incomes, and the continued diffusion of cheap copying technologies. At the time, we focused on music, movies, and software, for which the CD and DVD were the enabling technologies of large-scale informal exchange. But it seemed very likely that the market for books and articles was shaped by and vulnerable to similar dynamics. We assumed that the copying and downloading that provided access to movies and music for several billion people would soon be reproduced in the publishing sector.

As we explored these issues in 2009 and 2010 for the *Media Piracy* study, however, this was manifestly not the case. The digital transition for print had not yet expanded beyond a narrow, privileged digital reading public. Reading on screens remained an expensive and, in many contexts, poor substitute for reading on paper—indeed this is still a major factor shaping student practices. Large informal markets for "pirated" physical books were well developed in some countries, but the scale of the enterprise was small compared to the massive pirate markets for music and film, and targeted at

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mass-market titles rather than educational ones. At universities, access was still built around the last technological revolution—the photocopier—rather than the next one, for which the network and device infrastructure was still emerging. Digital editions and the means of distributing and consuming them—via both legal and illegal channels—were unevenly developed in high-income countries, and largely absent from middle- and low-income ones.

Because of the comparative durability of the print market, publishers have had the benefit of time to think through transitional strategies for the digital ecosystem. Having witnessed the speed with which digital culture overtook music, many were—and still are—waiting for their Napster moment, when the loss of control of digital distribution forces a reorganization of the business. For big research publishers like Elsevier and Wiley, the major online pirate libraries—with names like Gigapedia, LibGen, and now Sci-Hub—clearly represent that larger threat. And yet they're still waiting. The sky still hasn't fallen.

It hasn't fallen, in large part, because the educational publishing ecosystem is much more complex than the business monoculture that emerged around the music CD in the 1990s, and it is, in important respects, correspondingly more flexible and adaptable. Access to educational materials is shaped by a wide array of policies, institutions, and forces for change that have already reconfigured large parts of the ecosystem, and will continue to do so regardless (if not entirely independent) of what happens to Sci-Hub and its inevitable sequels. The higher-education ecosystem is composed of different yet overlapping ecosystems governing three major categories of material: textbooks, monographs, and scholarly journals. It is also divided by business models, with licensing to institutions the rule in the journal world and sales to individual students (mediated by faculty choices about what to teach) dominating textbooks and monographs. It is further differentiated by geography, wealth, and political history as countries have developed distinctive systems of support for research and higher education.

It is hard, in short, to tell a story about an ecosystem with so many moving parts. This is why, to the best of our knowledge, there aren't any comprehensive examples. Academic publishing is a subject surrounded by a surprisingly thin scholarly tradition, with comprehensive work largely limited to the Anglo-American world.[2] Student practices are typically the subject of applied and often narrow educational research—complemented in a few countries (such as the United States) by publishing industry surveys (Paxhia and Parsons 2013). Work on the changing relationships between publishers and libraries is scarce, mainly because financial data and other important structural information are usually hidden behind nondisclosure agreements. Libraries have paid little attention to the circulation of documents through other channels within

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the university—in part because, in an environment shaped by publisher lawsuits, the university has little incentive to uncover widespread infringement.

*Shadow Libraries* doesn't aim to offer a comprehensive account of these developments, but rather, to provide a framework for understanding the evolution of this ecosystem across a range of very different national contexts, including Brazil, Poland, South Africa, Argentina, Uruguay, India, and the United States. The conditions that produced Sci-Hub are part of this story, but our larger goal is to explore the question of access against the backdrop of the complicated globalization of higher education and the digitization of knowledge.

## The Common Thread

To a considerable extent, these different national experiences share an underlying story. We are in the midst of a massive expansion of higher education systems in middle- and low-income countries. We are also in a period of broad retreat of the state from responsibility for funding and managing that expansion. Where public provisioning of instructional materials was often seen as a necessary, if not always realized, part of the postwar expansion of primary and secondary education,[3] the more recent expansion of higher education produced no comparable public mandates. Instead, as the cost of textbooks, journal subscriptions, and monographs rose (pegged to the pricing strategies of the increasingly dominant international publishers), the challenge of providing affordable access to materials was left to strained libraries and, more often in practice, to students and faculty to figure out for themselves. Because these shifts coincided with the spread of cheap copying technologies—photocopiers and later the Internet, computing, and device ecosystem—the weakness of the formal models of access were partly compensated for by the growing strength of the informal ones. By the early 2000s, the principal form of access to materials in most countries, across most fields and types of scholarship, was informal copying and sharing.

Although plans for new forms of public support circulate at the margins of education policy debates, the main efforts to reimagine access in this context have come from two directions. First, from publishers and educational technology companies, which are assimilating many of the roles of libraries in the course of the shift to digital collections and are evolving into platforms for connected teaching, research, and learning services. Second, from faculty, librarians, and research funders advancing various articulations of "open" publishing in which works are made freely accessible.

Open and the more traditional "closed" publisher-led models have been generally viewed as competitive, but the more salient fact is that they have developed at

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different speeds. The scholarly publishing sector began to rapidly consolidate in the 1990s as scholarship was digitized, leading to the emergence of a handful of dominant research database providers by the mid-2000s. By 2013, five companies—Elsevier, Springer, Wiley-Blackwell, Taylor and Francis, and Sage—published 50 percent of all research papers, rising as high as 70 percent in the social sciences (Larivière, Haustein, and Mongeon 2015). In textbooks, similar processes of consolidation left three publishers—Pearson, McGraw-Hill, and Houghton Mifflin Harcourt—in command of over half the Anglophone market by 2014, and in positions, together with a handful of technology companies, to dominate the emerging fields of digital delivery and learning platforms.

Open publishing initiatives, in contrast, suffered from the coordination and scaling problems associated with an institutionally fragmented field, and from the incentive problems associated with a field already invested in functional—if problematic—models of access. Since the publication of the "Budapest Declaration" in 2002, which gave focus to the Open Access movement, open models have gained traction in some contexts, such as the growth of "prepublication" article archives that operate in parallel to the traditional journal system. The publicly funded SciELO project in Brazil has been an important model for developing-world scholarship, with over 43 percent of Brazilian research publications now available through open access channels (Van Noorden 2013b). More recently, both the United States and the European Union have taken steps to require open access publication for publicly funded research, though neither is a reality yet (Enserink 2016; Van Noorden 2013a). In contrast, "open educational resources"—generally abbreviated to OER—have made only limited progress in the general curriculum and remain a novelty in the world of scholarly books (Crossick 2016; Wolff, Rod, and Schonfeld 2016). The slow, uneven pace of these developments provides a context for impatient projects like Sci-Hub and the "guerilla open access" efforts of activists like Aaron Swartz, who was prosecuted for unauthorized bulk downloading of academic articles from the JSTOR database.[4]

As evolving closed, open, and informal models shape the landscape for research and instructional materials, the borders between them have become complex—crisscrossed by different pricing models, definitions of openness, institutional cultures, varied and often poorly defined flexibilities in copyright law, and a wide array of tolerated, assumed, and asserted uses. The result is a hodgepodge system that routinely fails to meet the demand of the hundreds of millions of students and researchers who need it and—at the same time—provides the best system yet for channeling the expanding wealth of human knowledge to the rapidly growing number of new knowledge seekers.

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## The Higher Education Boom and State Retreat

While the growth of higher education is often identified with the expansion of the U.S. and European public systems in the postwar period, the real global boom has occurred in the past twenty years in middle- and low-income countries. In 1995, there were 283 million people with postsecondary educations. In 2015, there were 725 million (IIASA 2015). In the past twenty years, India's student population quadrupled.[5] Brazil's tripled. South Africa's population, leaving behind the apartheid legacy, doubled. Poland's, leaving behind communist rule, more than doubled. So did Mexico's. In contrast, by the 1990s, growth in most high-income, low-birthrate countries had slowed: the U.S. university student population has grown at an annual rate of under 2 percent since 1990. German, French, Spanish, and Japanese enrollment fell slightly in the same period (OECD 2012). In middle- and low-income countries, high growth rates are expected to continue, leading to an increase in the overall number of college and university students from 100 million in 2000 to around 150 million in 2025 (Goastellec 2008).

Rising family incomes enable much of this growth, allowing parents to support years of additional education for their children. Changing aspirational horizons also play a large part, as higher educational achievement becomes the officially supported pathway for a rising middle class. Because these aspirational effects outpace the economic ones, growing educational systems often serve poorer and less prepared students than the comparatively elite systems they replace. Although access to higher education has proved achievable across a wide range of societies and political cultures, ensuring that those students can complete a quality education has proven far more challenging—and costly. Educational policy debates that focused for decades on issues of growth and access are evolving into debates about institutional quality and student support. The South African case documented in chapter 6 is telling: the government's post-apartheid commitment to expanding access to universities has been a clear success in terms of numbers enrolled but is severely challenged in other respects, with a nearly 50 percent dropout rate for three-year degrees and a massive student movement mobilized around issues of costs and stipends. A vulnerable student population is a volatile one, reactive to what can seem minor changes in fees or conditions. As we will see, the cost of materials has become a regular flashpoint in these contexts.

The financial underpinnings for educational expansion have also changed in the past several decades. Investment in higher education was a cornerstone of the post–World War II state, tied to a wide array of nation building, scientific, and social agendas. But by the 1990s, public commitment to education as an instrument of those agendas was in broad decline in many countries. As public investment flagged, private

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investment boomed—in India, private university enrollment increased from 31 percent of all students in 2001 to 59 percent in 2015; in sub-Saharan Africa, private institutions numbered 24 in 2000 and 468 in 2007; in 2011, private universities enrolled over 75 percent of all students in Brazil, supported by a shift in public resources from the support of public institutions to the subsidization of private ones (Almeida 2014). As the private sector played a larger role, students bore more of the financial burden of their educations.

In the United States and many other high-income countries, this transition was buffered by the accumulated strength of the public systems, by the relatively high purchasing power of students and institutions, and by the gradualism—after the 1980s—of both student growth and state retreat.[6] In many other countries, it more closely resembled a series of shocks, in which rapid expansion took place in the wake of economic crises, political revolutions, and compressed adoption curves for new technologies.

## Access from Below

The stagnation or decline of public support for public universities sharply constrained thinking about access to materials. Postwar plans for national development often prioritized improving access to books as a vehicle of social progress—perhaps nowhere more so than in India, where S. R. Ranganathan stamped government policy with his vision of a democratic, user-focused library science. Expansion of the public university system was usually accompanied by expansion of the public library system, in some cases complemented by cheap books initiatives designed to increase access to literature, science, and contemporary scholarship (Argentina's remarkable Eudeba publishing initiative is examined in chapter 4). U.S. cultural diplomacy, for its part, was heavily invested in cheap books policies until the late 1970s, and sent millions of books overseas as both instruments of development and weapons in its ideological struggle with the Soviet Union (Arndt 2005).

Few of these commitments survived into the 1990s to meet the explosion of student demand. Instead, university libraries had to cope with the rising costs of materials across multiple fronts, from journal databases to monographs to the international textbooks that increasingly served as standards within their fields. In the United States, textbook and journal database price increases ranged from 5 to 7 percent per year in the 1990s and 2000s, while library budgets remained largely static (Bergstrom et al. 2014; GAO 2013). Nearly all libraries responded by shifting resources from the acquisition of books to the licensing of databases, producing a boom in journal publisher revenues and a corresponding crisis in the university press world, which depended on

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library purchases of scholarly monographs (Brown and Boulderstone 2008; Crossick 2016; Thompson 2005).

For faculty and students, the emergence of cheaper and more powerful copying technologies provided a way to mitigate some of these problems, beginning with affordable photocopiers in the 1980s, personal computers in the 1990s, and the Internet and device ecosystem in the 2000s. The latter permitted not only copying but also the efficient resale of used books, creating a market in the United States, especially, that cut deeply into the sale of new textbooks. For each of these technologies, periods of rapid decline in prices resulted in very compressed adoption curves in middle- and low-income countries.[7] As new technologies became commonplace, they allowed for better-organized copying and distribution of materials by students and faculty, resulting in a mixed curricular ecosystem that combined the new, the used, and the copied. By the 1990s, cheap photocopying had produced a powerful side-channel that competed with and frequently surpassed the top-down models of provision organized around publishers and libraries. As the broadband and device ecosystem developed in the 2010s, these channels began to move online.

## Conflict

As photocopying became common in the 1980s, publishers began to push back against the uncompensated use of materials by students. For a number of reasons, these efforts rarely involved direct confrontation with or legal action against students themselves. In many countries, notably in Europe, students were legally in the clear: copyright law permitted copying and sharing by individuals under personal use provisions. Publishers generally received compensation at other stages of the copying lifecycle—principally via levies on copying equipment and later blank media (Hugenholtz, Guibault, and van Geffen 2003). In other countries, the scope of such rights was poorly defined, but publishers viewed legal action against students as unproductive—more likely to yield public relations disasters than meaningful impact on student practices. Not all publishers reached this conclusion: in Argentina, where copyright infringement was a criminal offense and educational exceptions were narrow, publishers instigated charges against students and faculty on numerous occasions. Argentine judges, however, showed little interest in applying the prescribed jail terms and fines for such offenses and—over several decades—shielded students and faculty behind rationalizations that carved out a de facto space of tolerated use.[8]

By far, the more common targets of enforcement and legal pressure have been the intermediaries in the copying ecosystem: copy shops and universities. As photocopier

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prices fell in the late 1970s, copy shops became commonplace around universities and enabled the shift of parts of the curriculum to coursepacks and other reproduced materials. In some countries, legal pressure brought copy shop chains into licensing agreements with publishers—in the United States, for example, via a 1989 lawsuit against the Kinkos copy shop chain. In other countries, the copy shops remained primarily in the informal or unregulated sector and became targets of police action. From an enforcement perspective, this had some significant advantages over the targeting of end users: the shops were easy to raid and easy to prosecute given the applicability of criminal penalties to commercially motivated infringement. The shops also generally lacked major institutional allies to advocate for them or shield them from legal action.

The copy shop raid became the iconic form of conflict between publishers and students in middle- and low-income countries. There is no evidence, however (and indeed no claims that we're aware of), that such efforts had lasting effects on student copying. Copy shops proved to be relatively resilient: easily shut down but also easily reestablished. Police raids generated headlines but also controversy. Raids within campuses, especially, tended to consolidate student and university support for stronger protections for copying, with occasionally important results. In Brazil, raids on copy shops in and around several universities in Sao Paulo in 2004–2005 and again in 2010 prompted a number of schools to declare their own educational exceptions to copyright—including the reproductions of chapters, substantial excepts, and whole works when out of print. In Uruguay, a series of raids during finals in 2011 produced a student-led copyright reform movement that led to a significant (though currently stalled) process of copyright reform. In India, the "Delhi University photocopying case" pitted Oxford University Press, Cambridge University Press, and other large academic publishers against a university-based photocopying center—triggering wider efforts to legalize the zone of informal copying practices that shape much of Indian student life. By late 2017, the university had prevailed on some points but the case was ongoing.

## Universities

Universities play complicated roles in these conflicts, shaped by the fact that few make adequate provision of materials to their students. Regardless of copyright law, administrative preferences, or official positions, this reality usually dictates policies of toleration or accommodation of student practices—in some cases turning a blind eye to the copying ecosystem and in other cases moving to formally or semiformally incorporate it. This tolerance also reflects the proliferation of copying and communication technologies throughout the student and faculty population, which makes the copyright

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management function traditionally centralized in libraries largely obsolete. Few universities have been willing to take on the expanded electronic surveillance of students and faculty necessary to monitor the flow of material across the range of digital platforms and services in classroom use.[9] Official campus systems for classroom support—the various "learning management systems" or LMSs that have recently become common in middle- and low-income countries—have not been adapted to this purpose and in any event host only part of this activity. In most countries, campus LMSs play catch-up with the array of other social media and collaborative tools in widespread classroom use. All of the major social media platforms host student communities, and therefore ad hoc shadow libraries.

Universities also face uncertainty about the scope of educational limitations and exceptions to copyright, especially in regard to the making of digital copies and compilations or coursepacks. As Nobre (2014) documents in the case of the European Union, there is a great deal of variation in national law on these issues, "silence" with respect to many common activities, and very little clarifying jurisprudence. Universities have tended to be risk averse as a matter of formal policy but also accommodating of the evolving communicative and scholarly practices of students, faculty, and staff. In some cases, universities have decided that some regulation is better than none, and opted to incorporate these copying practices. This remains a sharply disputed subject within copyright law and has prompted publisher lawsuits in a number of countries. Although the situations and legal contexts of these cases vary, they generally share the purpose of trying to pull universities back from interpretations of the law that might sanction informal copy culture. These are the stakes of the Delhi photocopying case (chapter 7), which involves a campus-licensed copy service; of conflict over copying at the University of Buenos Aires (chapter 4); of the Brazilian university declaration of educational exceptions (chapter 8), and of the recently concluded Georgia State University case in the United States, which involved the copying of material by library staff for e-reserves.[10]

At one level, these skirmishes testify to the conservatism of universities. Few have followed the Brazilian example of cutting through the knot of narrow or obsolete copyright exceptions. Few have accepted publisher proposals to adopt more extensive surveillance and control of students and faculty—and, to the best of our knowledge, none to any significant effect. Few have moved decisively toward open models for the range of academic and teaching publications in use—though some schools, systems, and national research funders have begun to do so for research articles. In practice, the informal copying ecosystem operates as a safety valve for these conversations, denying publishers the more complete markets they want but also forestalling a sharper crisis of

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access that might lead to a break with existing publishing and policy paradigms. The copying ecosystem compensates, imperfectly but also cheaply, for the weaknesses of the commercial and library models of provision. Where this ecosystem is not internalized by the university, it is externalized by the students.

## Change

Such arrangements can probably continue for some time in most countries, sustained by the inertia of public investment, university conservatism, and policy gridlock. But stresses on the system are growing. The main forms of pushback against unauthorized student copying have been efforts to internalize the cost of materials within the university, shifting the burden from student wallets to less visible and nondiscretionary mechanisms like library budgets and student fees. This is the model for journal database subscriptions (typically paid for by libraries, sometimes in combination with larger consortia or public funding) and for the various collective licensing agreements that cover photocopying in some university systems (typically paid through student fees). The ability to license to institutions rather than sell to students, in turn, allows for complex forms of differential pricing, as publishers set prices based on university ability to pay. Differential pricing, in turn, has provided a framework for the expansion of database access into middle- and low-income countries, especially in the past decade: Harvard University pays much more, for example, than the University of Cape Town for its Elsevier journals (and also more than poorer schools in the United States).[11] But these practices also produce a system that operates at the edge of affordability for all players, creating incentives to defect. As publishers raise prices, the system grows more fragile. Libraries cannibalize other operations to pay for journal databases, notably budgets for the purchase of monographs—the bread and butter of the university publishers. Open access moves a step closer, as institutional and funder mandates slowly spread, but so far without a larger answer to the long-term funding question that would make it a viable replacement for the commercial ecosystem. Copy shops and shadow libraries, meanwhile, operate as stopgaps at the low end, deferring the need for universities to make harder economic and policy choices.

Similar dynamics play out in the textbook market, where price increases have consistently outpaced inflation over the past three decades and where major publishers have relied on differential pricing to serve global markets. Here, the primary threat to publisher interests has not been piracy but the emergence of organized used textbook markets in the United States and—more slowly—in other countries, which have eroded year-to-year demand for new books by an estimated one-third. The used book market,

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in turn, has fueled a cycle of endless and often trivial revised editions designed primarily to make the books already in circulation obsolete. Here the window of time for conventional "piracy" appears to be quite limited as textbooks are combined with (and eventually become) software services that integrate with other systems for classroom support. Several of the major textbook publishers are already moving in this direction, evolving into platforms for learning services capable of supporting many different types of content—including "open" materials.

This evolution is likely to be accelerated by the 2013 U.S. Supreme Court decision in *Kirtsaeng v. John Wiley & Sons, Inc.*, which broke the U.S. ban on the parallel importation of copyrighted works that structured differential pricing in the international market. Supap Kirtsaeng, in the eponymous case, was an American medical student who built a small business importing cheaper international editions of major textbooks from Thailand. Wiley & Sons argued that Kirtsaeng's actions violated its right as the copyright holder to enforce territorial licenses, which set prices in different countries. The Supreme Court ruled that because the books had been legally purchased, Kirtsaeng was free to do with them what he wished (giving precedence to the "first-sale doctrine" in copyright law). The short-term fallout of the case was the withdrawal of cheaper U.S. editions from global markets and a corresponding rise in prices. The medium-term fallout is the opportunity for local publishers and open educational resource initiatives to expand their shares of domestic educational markets as import prices rise. The longer-term fallout is likely to be the reestablishment of differential pricing arrangements through contract rather than copyright law, as textbooks and other materials evolve into more easily policeable software services.

## Policy

The advent of large-scale copying by students and faculty has prompted three types of policy response. We have discussed two:

- Efforts to reinforce the boundary between "pirate" and legal markets through copyright enforcement actions against students, copy shops, and more recently the higher-profile shadow libraries.
- Efforts to shift the cost of materials from students and faculty toward institutions via open publishing models, database licensing, and collective licensing agreements, thereby rendering unauthorized copying marginal or irrelevant.

The third policy response is the effort by librarians and educational activists to broaden limitations and exceptions to copyright law in ways that legalize more of the

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informal copying ecosystem. Such proposals generally seek to expand the scope of permissible copying for educational use so that, for example, faculty do not need permission to put together coursepacks with articles or chapters from copyrighted works, and libraries are freer to distribute materials digitally without arbitrary restrictions, such as measures that limit simultaneous digital access to some number of equivalent paper copies.[12]

Nearly all such efforts have bumped up against the Berne Convention—the 1886 international copyright agreement to which nearly all countries are subscribed. Berne subjects limitations on copyright to the well-known (among copyright scholars, at least) *three-step test*, of which the main requirement is that a limitation or exception not "conflict with a normal exploitation of the work." Because the commercial sale of educational materials is relatively easy to characterize as normal exploitation, Berne poses challenges to expanding educational access. Tensions between developing countries and wealthy countries on this issue are longstanding and led, in the mid-1960s, to a developing country-led proposal for shorter copyright terms and compulsory licensing of works under certain circumstances, such as educational use. British publishers strongly opposed the proposal, and the resulting controversy nearly broke the convention (Wirten 2010).[13]

Few countries, in the end, have made broad accommodations for educational copying in their laws,[14] though the issue continues to percolate through national case law and has become conflated with advocacy on behalf of a broader application of the "right to education" embedded in many post–World War II constitutions (including, in this study, India, Brazil, and South Africa). A number of groups have kept library and educational exceptions on the policy agendas of major international organizations working in this field, including the World Intellectual Property Organization (WIPO), which has appeared ready to take up the question at several points in the past decade.[15] Whether or not expansions of exceptions would materially impact the market for such works—and certainly that is possible—they would also in many cases simply ratify the status quo, ending a situation that leaves much of the educational and research enterprise on the wrong side of the law or, at best, under a cloud of legal uncertainty.

Because states have generally been unwilling to seriously challenge either the rights of publishers or the copying practices of students, the main lines in this debate have tended to shift toward easier bases for consensus, such as figuring out how to get the state to pay more of the cost of materials. Struggles to increase or capture state support for educational materials figure prominently in several of the following chapters, as students and—in some cases—large student movements react to the growing financial

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burdens of higher education. Such support is widely viewed, moreover, as critical to the success of open access versions of the traditional journal system—especially so-called gold open access, in which the editorial and production process remains the same as for traditional journals, but the results are made freely available online. These efforts may well be able to reduce topline costs vis à vis the large commercial publishers, whose net revenues are commonly estimated at around 35 percent (compared to around 20 percent for journals run by nonprofits such as PLOS [Holcombe 2015]). But they cannot escape editorial costs altogether, which represent the largest share in both journal and monograph publishing (Maron et al. 2016; Van Noorden 2013b). And they cannot escape the increasing scale of the scientific publishing enterprise, as more students lead to more researchers, more published research, and greater expectations of comprehensive access (Larsen and von Ins 2010).

## The Country Studies

There are many signs of stress and reinvention in the educational and scholarly publishing ecosystem, which is pushed and pulled in different ways by publishers, libraries, and students—and increasingly by major research funders. But outside the area of publicly funded research, there is little evidence that states are rethinking the underlying dilemmas of access and affordability produced by decades of educational expansion, funding retrenchment, and cheap copying technologies. Instead, as global higher education has grown, informal systems fill the vacuum at many institutions and provide a path for students and faculty into wider-knowledge communities. The nine chapters in this study trace some of the history and politics of these struggles for access around the world.

Chapter 2, by Balázs Bodó, explores the deeply Russian history of the major international shadow libraries, which began with clandestine "samizdat" publishing and archiving under Soviet rule and eventuated in large-scale efforts like LibGen and Sci-Hub. Bodó traces a nearly straight line from the underground photocopying and smuggling networks that resisted Soviet censorship, to the efforts of Russian academics in the 1990s to digitize and distribute Russian academic literature in the face of economic crisis and institutional collapse, to the emergence of more ambitious efforts to aggregate and organize those collections in the 2000s under a vision that was both elitist and universalist—a communism of knowledge rather than production. Bodó's chapter also introduces a recurring thread in this volume: the connection of contemporary practices of copying and shadow library building to histories of censorship and repression. The commercial stakes of many of today's battles over copyright and copying obscure

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a more important lineage in which resistance to oppression was largely synonymous with the illicit copying and distribution of books and articles.

Chapter 3, also by Balázs Bodó, is a short quantitative account of the expansion of two of the major shadow libraries in the late 2000s, based on traffic data, as they assimilated the majority of Russian scholarly material and began to incorporate large English and other language collections. This period, roughly between 2006 and 2008, marked the emergence of the global shadow library and its unique role in supporting developing-world academics. This geography of knowledge is clearly visible in the top ten countries downloading from these sites: Russia, Indonesia, the United States, India, Iran, Egypt, China, Germany, the UK, and Ukraine.

Chapter 4, by Evelin Heidel, is the first of several chapters to trace the postwar history of efforts to ensure the affordable provision of books and educational materials, followed by the retreat of the major institutional actors and the shifting of the burden of access to students. In Argentina, this story has three main components: (1) the emergence of publishing strategies to increase access to materials during the post–World War II "golden age" of the university system, exemplified by the creation of the university press, Eudeba, in 1958; (2) the often violent attacks on these institutions by the dictatorships of the 1960s and 1970s, and the subsequent failures of both the postdictatorship state and the publishing industry to formulate alternatives under the pressure of the economic crises of the 1980s, 1990s, and 2000s; and (3) in this institutional vacuum, the growth of student-organized efforts to copy and circulate course materials. The chapter provides a brief history of the Spanish-language shadow library, surveying student and faculty efforts across Latin America in the mid-2000s and ending with the still-contested history of BiblioFyL—an online archive built by students at the University of Buenos Aires.

Chapter 5, by Eve Gray and Laura Czerniewicz, is a deep dive into the transformation of South African higher education after apartheid and the transition to democratic rule. The chapter provides this volume's main account of the international dynamics of the Anglophone publishing industry, structured by both domestic and international consolidation over the past two decades; by continuous tensions between domestic and imported supply (mapped to debates over cost and the need for localized content); and by the effort to make affordable, flexible, and digital materials available to the new (and often poor and ill-prepared) students entering the system. The chapter explores the role of education policy in these changes, as the South African government worked to make higher education available to millions of black South Africans and to undo the institutionalized racism of the apartheid era. Finally, chapter 5 examines the daily practices of students whose educational success is shaped by the choices they make about

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which class materials to buy and which to do without. These are not obscure issues in South Africa: for the past three years, student demonstrations against the cost of higher education have closed major university campuses, in some cases for weeks.

Chapter 6, by Mirosław Filiciak and Alek Tarkowski, looks at access to materials in the context of the roughly contemporaneous boom and restructuring of Polish higher education after the collapse of Communist Party rule in 1989. Widely viewed as a success story in educational modernization and expansion, the Polish situation also epitomizes the dilemma of a "small language"-based educational system operating in an increasingly globalized English-based academic culture—a condition common to most of the countries in Europe and one that promotes forms of parallelism in publishing and digital access. One aspect of this history is the emergence a large, effectively national, shadow library—the file-locker site Chomikuj ("Hamster")—which services the wide array of communities seeking Polish language media, from movies to books. The chapter also explores policy and institutional struggles around open access and copyright exceptions, beginning with debates over requirements for publicly funded research (which, as in most European countries, covers nearly all Polish research publication). Lastly, it looks at the student ecosystem in which the prominence of Chomikuj displaces some of the locally organized sharing and copying practices visible in other countries, and in which a sizeable percentage of students opt to acquire no materials at all.

Chapter 7, by Lawrence Liang, explores the history of Indian struggles for access to books—first through the lens of library policy and later through the myriad channels of student photocopying, sharing, and downloading that accompany the current boom in Indian higher education. The chapter is framed by reflection on the larger aspirational structures that have always shaped library building: at one level, the age-old desire to unify human knowledge visible in the mythologies of Babel, Alexandria, and Google; and at another, the much more personal conceptions of libraries as pathways for self-realization. The Indian versions of this story pass, as all of our studies do, through the contemporary surge in access to higher education and the comparatively slow parallel expansion of legal access to materials. It passes through the experience of arbitrary exclusion from the global culture of knowledge and ideas that shapes the lives of many Indian students and researchers, and that puts strategies for overcoming those obstacles at the center of many Indian intellectual biographies. In this context, the chapter traces some of the specific struggles that shape the Indian politics of access to knowledge, including the Delhi photocopying case and other debates about the scope of educational exceptions to Indian copyright law. As in South Africa, these debates are part of broader efforts to articulate and expand the constitutional right to education.

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Chapter 8, by Pedro Mizukami and Jhessica Reia, examines practices of access and sharing among university students in Brazil against a complex backdrop of institutional and political factors, including the restricted legal scope for educational copying, the inability of publishers to set up a functional licensing regime for photocopying, increasingly aggressive enforcement actions targeted at universities and copy shops, and diverse open publishing initiatives. As the Brazilian student population continues to expand—especially, since the 1990s, in the private sector—and as access to digital technologies continues to improve, informal copying is ubiquitous but in a state of transition. Photocopying is still central to Brazilian university life, but newer practices of digital sharing are emerging. Large-scale archives of materials rivaling the scale and efficiency of LibGen have not emerged for Portuguese-language materials, but a close look at student and professor practices reveals a multitude of more precarious, community-based, ad hoc shadow libraries, distributed across millions of flash drives, cyberlockers, social media services, and cloud storage accounts.

Our short coda (chapter 9, by Jorge Gemetto and Mariana Fossatti) offers a brief account of the copy shop raids, publisher politics, and student-led copyright reform effort in Uruguay, underway since 2013.

Most of the studies in this volume use mixed methods, from interviews to student focus groups to surveys and legal research. Broadly, this reflects a decision to give each contributing group of researchers the opportunity to tell the best story they could about educational change and student practices in their respective countries. All of the larger country studies have a survey component based on a common template, conducted at one or more universities and ranging from several hundred respondents to nearly two thousand in the case of Brazil. These surveys were designed to elicit accounts of how students acquire and use materials—a topic that is too often a black box in discussions of educational, curricular, and copyright reform. With the exception of Brazil, none of these surveys are statistically representative of the student body—nationally, or even within their universities. In Brazil, student participation was self-selected and limited to a few disciplines: medicine, media and communications studies, and law—the latter two selected because they were the home disciplines of most of the contributing researchers.[16] Although we report quantitative results from this work, we take pains to situate them within accounts that build on a wider array of evidence—making survey data illustrative of phenomena and practices identified from multiple angles.[17]

We're also mindful of the rapid evolution of the ecosystems we have described, which have changed significantly even within the four-year span of these studies. Our results clearly suggest that we have not yet seen a "native" digital generation. Devices remain poor substitutes for books in many situations and print is heavily favored over

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screen reading across all of the student groups (to the point where students routinely print out materials they have downloaded). This marks our study as a transitional one, catching the moment of widespread digitization of materials and related infrastructure but not yet the digitization of the wider teaching, learning, and research ecosystem, and not the stabilization of legal models and frameworks that can keep pace with the growth of higher education and the global scale of emerging knowledge communities.

The studies identify no simple path through these challenges, but they do shed uncommon light on the nature of the problem. The democratization of access to higher education is a stunning if also complicated and still-evolving achievement. The democratization of access to the written products of that achievement is incomplete and passes, in middle- and low-income countries, through mostly informal channels.

As we said in our *Media Piracy* study in 2011, this informal copy culture is shaped by high prices, low incomes, and cheap technology—and only in very limited ways by copyright enforcement. As long as the Internet remains "open" in the sense of affording privacy and anonymity, shadow libraries, large and small, will remain powerful facts of educational life. As in the case of music and movies, we think the language of crisis serves this discussion poorly. This is an era of radical abundance of scholarship, instructional materials, and educational opportunity. The rest is politics.

## Notes

1. The two most common are open access (OA) and open educational resources (OER)—though the concepts overlap and distinctions between the two are not always precise. OA typically refers to the movement in research communities to archive prepublication versions of journal articles in openly accessible archives, with the expectation that definitive versions will be published through the more traditional journal system. This is often described as "green" open access. When the destination journal publishes under a Creative Commons or other open license (making the finished product freely available immediately), the model is called "gold" open access. OER typically refers to instructional materials such as textbooks published under a Creative Commons or other license that ensures free use. The terms have distinct founding documents in the Budapest Open Access Initiative (2002) and the UNESCO-sponsored Paris OER Declaration (UNESCO 2012). For brevity's sake, the introduction generally combines the two under the rubric of "open" publishing models.

2. See, for example, Thompson 2005. General and especially national histories of publishing are more widely available, including Feather 2006 on British publishing, Lorimer 2012 on Canadian publishing, Hallewell 1982 on Brazilian and Portuguese-language publishing, and Fernández 1977 for Hispano-America.

3. Public provisioning sometimes meant a direct state role in publishing—this was the model articulated, in different ways, in the Soviet Union, India, Brazil, Nigeria, and many other develop-

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ing countries. In the United States and Western European countries, it has meant public financing for textbooks purchased from commercial publishers. See Heyneman 2006 on the growth and very uneven success of public provisioning models.

4. Swartz was prosecuted not for copyright infringement (JSTOR did not press charges), but for violations of the Computer Fraud and Abuse Act, including unauthorized access to the MIT computer network through which he downloaded the articles. Facing trial and the possibility of a lengthy prison sentence, Swartz committed suicide in 2013. See Swartz's "Guerrilla Open Access Manifesto" (Swartz 2008) for the most influential, highly political version of this agenda.

5. China's student population also quadrupled and continues to grow rapidly. The very different dynamics of Chinese higher education fall outside the scope of this work.

6. We won't dwell on the well-documented and paradigmatic U.S. case, in which state support for public universities declined by some 37 percent since 2000 (Pew Charitable Trusts 2015) and median tuition increased by over 50 percent (54 percent between 2003 and 2012 according to the GAO (2010). Growing Federal support has moderated some of the apparent decline, but has occurred almost entirely in the areas of research grants and student loans.

7. For photocopiers, this process was driven by the emergence of Ricoh, Minolta, and other Japanese competitors to Xerox in the mid to late 1970s.

8. Among the more prominent current cases is that of the student Diego Gomez in Colombia—which like much of Latin America has had weak copyright exceptions for personal and educational use. Gomez was accused of criminal copyright infringement for posting an academic thesis to the online service Scribd (Stokstad 2014). In this case, prosecutors brought the charges independent of publisher involvement, but the case is widely viewed as an act of adherence to the U.S.-Colombia bilateral trade agreement that entered into effect in 2012, which enjoyed strong publisher support for narrowed fair use and other exceptions. Gomez was pronounced not guilty in March 2017, but the prosecutor has appealed the verdict.

9. Canada's recent "Access Copyright" collective licensing agreements fell apart in 2012 in part over obligations to monitor faculty communication for unauthorized distribution of materials (Amani 2013).

10. The Georgia State ruling was widely viewed as a win for educational fair use: of seventy-five initial claims of infringement brought by the publishers (here, Cambridge University Press, Oxford University Press, and Sage Publications), the court found in favor of only four—in each case representing the copying of multiple full chapters. While the ruling appears to give universities more scope for digitization and compilation of materials for classroom use, the decision was a complicated one that established no clear boundaries or tests (Butler 2016).

11. Price discrimination is also maintained through the secrecy surrounding publisher-university deals, enforced through contracts. In the United States, Bergstrom and Courant have done the most to reconstruct this terrain through Freedom of Information Requests to public institutions. See Bergstrom et al. 2014.

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12. Such measures are often combined with a longer list of exceptions and limitations sought by libraries and archives, which have focused in recent years on building digital collections for works that are out of print, "orphaned" (i.e., without an identifiable copyright holder), or otherwise unavailable.

13. In 1971, a compromise "Berne Appendix" was passed that introduced a number of remedies for developing countries, including limited compulsory licensing solutions. In practice, however, these proved very cumbersome to implement and use, and only a handful of countries have done so (Cerda Silva 2012; Chon 2011).

14. The most expansive slate of educational limitations and exceptions currently belongs to Estonia, which permits almost any reproduction or other use of materials for teaching and research purposes (Nobre 2016). Numerous countries vie for the title of most limited educational exceptions, with France and Spain arguably leading the pack due to a lack of provisions for faculty-compiled compilations. For a broad international account, see Crews 2014.

15. Educational limitations and exceptions were split off from library and archival proposals by advocates in a tactical effort to break the WIPO conversation into manageable portions. The first step in this process was the negotiation of a treaty covering expanded limitations and exceptions for the visually impaired. It was passed in 2015. Libraries and archives are generally perceived as next on the agenda, although this is unsettled and not without controversy. For the most developed libraries proposal, see the International Federation of Library Association's "Treaty Proposal on Limitations and Exceptions for Libraries and Archives" (IFLA 2013).

16. The disciplinary differences proved illustrative of the some of the larger dynamics we explore in the studies. Media and communications, for example, showed significantly higher levels of all copying and sharing practices than law or medicine. The most likely explanation is the greater dependence of these fields on international research articles and expensive monographs—both categories that lend themselves to large-scale digital archiving. Legal education, in comparison, relies heavily on locally developed, locally relevant, and up-to-date textbooks and case law. Medical education, in turn, relies on international standard textbooks and reference books, but also on high-production-value imagery that unauthorized channels have been slow to reproduce. These differences in practice also track differences in student resources, with medical students matriculating from wealthier families than law students. Media and communications students trailed well behind both fields in family wealth, making them better representatives of the high-price, low-income dynamics that define the pirate ecosystem around the books and other media.

17. Because not all universities were eager to be named in studies of unauthorized copying, we have anonymized all but a few of the locations and all of the respondent identities.

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